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considering if dining environment influence patient healing?

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8. Hospital Foodscape Design – considering if dining environment influence patient healing?

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Timeline: 01.08.2009 – 01.08.2012

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Collaboration: None, but using Aalborg Hospital and the project MORE as main case study

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Research Output: Design Guidelines on patient dining facilities and theoretical framework on Foodscape Design

Project/chapter	Theory input	Methodology	Epistemology
HOSPITAL FOODSCAPE DESIGN – considering if dining environment influence patient healing	**Social Science** (everyday life, Actor-Network Theory, Socio-Spatial Theory) **Food Sociology** (meal behaviour) **Consumer Science** (meal experience) **Architectural Theory:**Healing Architecture Dining Interior Space Perception & Sense of Place Dwelling & Wellbeing	**Strategy**: abductive **Approach:** CASE STUDY (embedded multiple case) **Methods:** Qualitative: Interviews, observations, participant observation, photo documentary, drawing Quantitative: measuring patient output	**Viewpoint:** Holistic **Approach:** Empirical-analytical Hermeneutic-Interpretive **Philosophy:** Phenomenology Semiotics

Introduction

During the next ten years Denmark is facing the task of designing and constructing five new "Super Hospitals". (SUM 2009) This task represents a historical and political important awareness on public healthcare in Denmark, but further poses a unique opportunity for updating and rethinking hospital designs, as well as improving current challenges on patient healing. However, health related research show that one of the main challenges in today's patient healing is the *nutritional healthcare* during hospitalization and the risk of patients suffering from malnutrition or undernourishment. (Rasmussen et al. 2004, Edington et al. 2000) Because undernourishment can be associated with increased risk of complications, increased length of stay, more prescriptions, higher rate of infections, and diminished quality of life (Lindorff-Larsen et al. 2007 p. 372) the clinical outcome and treatments, as well as the cost and effect of patient healing procedures are highly influenced. (Niewenhuizen et al. 2009) To be able to overcome this, hospitals need to start focusing more on modifying diets and nutrition to support the needs of each patient as part of the hospital treatment. (Rasmussen et al. 2004, Rasmussen et al. 2006b) However, back in 1990 a Danish study on malnutrition among hospitalized children found that the problem of undernourishment possibly was not just a matter of wrong nutrition and a poor diet, but as well a social and cultural matter bound to the entire eating situation. (Holm 2003b p. 279) The hypothesis behind the study speculated that nutritional wellbeing not only depends on physically obtaining the right amount of nutrition, but as much about consuming *a meal* and being part of a larger social context. (Holm 2003b, Holm & Jacobsen 1990) Relative hereto, Holm & Jacobsen (1990) further found that both the social context and the ability to create *a meal* were strongly dependent on the *eating environment*; the spatial settings and the specific room configuration, as well as the specific dining interior embracing the meal. (Holm 2003 p. 284,293)

Problem Definition

At Aalborg Hospital a small group of doctors, nurses and nutritional staff back in 2008 initiated a project called "MORE". Their goal was to improve the treatment outcome and healing process by focusing more on the nutritional wellbeing of the patients, and by focusing more on the individual needs and desires when eating and having a meal during hospitalization. (MORE 2009) The group initiated nutritional therapy with direct improvement of the food and focused on how to improve the nutritional values obtained by each patient during eating through initiatives of screening, monitoring and developing nutrition plans as well as introducing "in-between snacking". (MORE 2009) The group further had ideas about improving the entire eating situation and patient meal experience, by means of altering the specific eating environment and dining facilities, but this has not been implemented yet partly due to lacking economy, but also due to lacking knowledge on the influence of the eating environment and *how to design* these dining facilities to improve patient meal experiences? (MORE 2010) Despite the above observations made by Holm & Jacobsen (1990) seemingly very little research and scientific knowledge exists on patient dining and designing hospital dining facilities.

State-of-the-art Research

A review of the existing research performed on patient eating, hospital dining interior and the direct relationship between hospital dining interior and patients' nutritional wellbeing show in general very sparse results. Most contemporary research specifies only the direct importance of physical exercise, easy access to fruits and vegetables, and fatty types of foods and in-between snacks as means

to overcome malnourishment from a treatment point of view (Bere & Brug 2009, LEV 1997), or looks directly upon the logistic, educational and administrative challenges of meal servings in hospitals. (Gibbons & Henry 2005, Almdal et al. 2003, Rasmussen et al. 2004) Same research rarely considers nutritional healthcare as a matter ranging beyond the specific food items eaten and patients' nutritional wellbeing. Nor relate to the wider contextual aspects as the eating environment, its inherited social values as seen from the perspective of the individual patient and how to actually design the dining facilities to *facilitate* a good meal experience. This is evident whether studying research based on empirical or hermeneutic methods, and whether we look upon architectural research in general, food and meal science, health science or social science. (Olsen 2008) The meal as a separate concept from the specific food eaten and a precise theoretical definition of how the spatial aspects of the eating environment impact on eating behavior and nutritional wellbeing has not been given much priority, and there is apparently no linking in contemporary research between aspects of hospital architecture or design of hospital dining interior and the eating behavior possibly causing malnutrition among patients. The sparse amount of research existing possibly linking architectural and interior design with meals, relate directly to qualitative and quantitative research on behavioural studies, theories on human interaction, and theories of sociology in general. (see e.g. Holm 2003, Murcott 2009) As well as knowledge on product experience from a consumer and retail point of view (see e.g. Schifferstein & Hekkert, 2008, Desmet & Hekkert, 2007), research on contextual influences in food choice, consumer preference and food acceptability during eating (see e.g. King et al. 2004, Gustafsson 2004, Meiselman 2000, Stroebele & De Castro 2004). Only recently with the introduction of *Evidence-Based Design (EBD)* and *Healing Architecture* have researchers begun arguing the influence of built environment on patient wellbeing and healing processes (see e.g. Ulrich et al. 2004, Frandsen et al. 2009, Zimring & Herd 2008). However, most research in EBD and Healing Architecture focus only on how the latent architectural aspects of the hospital environment like; noise, lack of space, light, ventilation, surface coverings, nature, art, sound, medical equipment possibly influence human wellbeing, as well as medical-related errors ascribed for instance; active failures, mistakes and misunderstandings in medication or surgical procedures, or physical injuries and infections obtained by patients during the healing process. (Zimering & Herd 2008, Ulrich et al. 2004)

The Problem

I find that the specific area of *nutritional wellbeing* and the understanding of the contextual influence of the dining environment on patient eating is overlooked and neglected both in contemporary design research and professional design practice. And it is my claim that a large gap exists in the contemporary knowledge, practice and research on patient healing and hospital design in general. Both research and practice related to hospital design lacks, in my opinion, the understanding of the eating environment; *the foodscape* and how the specific dining interior and spatial setting (room configuration and spatial layout) around eating mediates our behavior and social relations when having *a meal.*

The Hypothesis

The hypothesis of this PhD project is that when our understanding of eating and the aspects shaping the *meal experience* is broadened beyond the specific food item eaten, to further depending on the entire social and cultural context, an important aspect of nutritional wellbeing becomes the specific eating environment; *the foodscape.* Here the *"foodscape"* is to be understood as a holistic perspective on nutritional wellbeing and the meal experience, encompassing both the physical dining environment; the room configuration, the spatial layout, the dining interior, the décor, the furniture,

the tableware and utensils, but also the social, cultural and personal values of eating. It is an environment, a *"scape"*, framing the entire meal and staging the meal experience. With this understanding of the foodscape patients' nutritional wellbeing and healing process can possibly be improved by providing better eating facilities embracing their meals, and the task of *providing* a setting for eating in hospitals becomes suddenly a very different task from consciously and intentionally *designing* a dining facility for having a meal.

Objective and goal

The objective and overall goal of this PhD project is therefore to develop more relevant research and widen existing theoretical perspectives on hospital design with the objectives of *how* architecture and foodscape design possibly can help improve meal experiences and eating satisfaction among hospital patients. And as part hereof furthermore develop a conceptual proposal for design guidelines on future patient dining facilities at Danish Hospitals exemplifying this. Together the research- and design inquiries should contribute to guide future professional practice in "super hospital" design. This motivates the following research question:

The research Question

- *How can the design of dining facilities in hospitals possibly help improve meal experiences among patients, thus indirectly help improve their nutritional wellbeing and overall healing process?*

Epistemological Background

The claim that large gaps exist within contemporary knowledge, research and practice in hospital design is based on the initiate definition of the foodscape and the overall hypothesis that dining interior and eating facilities influence nutritional wellbeing. An **implicit assumption** in this hypothesis is, however, that health and healing processes is linked to both our physical, mental and social wellbeing, and that the nutritional wellbeing is an important aspect of these. That patients' health therefore partly depends on nutritional wellbeing and eating properly, and that nutritional wellbeing is not just a matter of getting the appropriate amount of nutrition and being satiated physiologically. But as much about the social satisfaction and enrolling oneself in a community; showing or articulating a sense of belonging through the concept of *a meal* and its surrounding spatial environment.

With this hypothesis we automatically adopt a particular ontological worldview and a philosophical foundation. We take a very precise epistemological stand, and relative hereto develops a specific set of assumptions about human behavior and how to understand it and the interaction with space. It is a holistic understanding initially based on the findings and theoretical considerations of the study performed by Holm & Jacobsen (1990). Here hospital meal servings are perceived as more than mere nutrition, taking place in larger context and serving higher means than nutritional satiety, and Holm & Jacobsen (1990) specifically emphasize the "forgotten" architectural knowledge on hospital design to create spaces and places for eating and having a meal. And further emphasized how the hospital architecture influenced the children's' nutritional wellbeing by means of social values and feeling at home. (Holm 2003) However, we further lean on existing theories on nutritional wellbeing, food behavior and social interaction derived within respectively food science

and nutrition, as well as sociology and social science who supports the stand of Holm & Jacobsen (1990), and whose empirical studies performed in canteens at universities, schools, in the army and at restaurants across these different research areas show that food preference, food choice and consumer satisfaction are dependent on the contextual environment and social interactions (see e.g. Meiselman et al. 2000, King et al. 2004, Gustafsson 2004, Stroebele & De Castro 2004, Sobal & Wansink 2007).

However, the specific study by Holm & Jacobsen (1990) seemingly pays little interest in the profound understanding of *how* the hospital architecture and dining environment on a design level influence the nutritional wellbeing of the children. They neither theoretically nor practically describe how the specific interior and spatial elements are relevant for achieving this state of social wellbeing and feeling at home, or how they should be shaped to achieve this feeling. *Why does a single grand table work better than small, why does a common central kitchen work better then decentralized units, and*

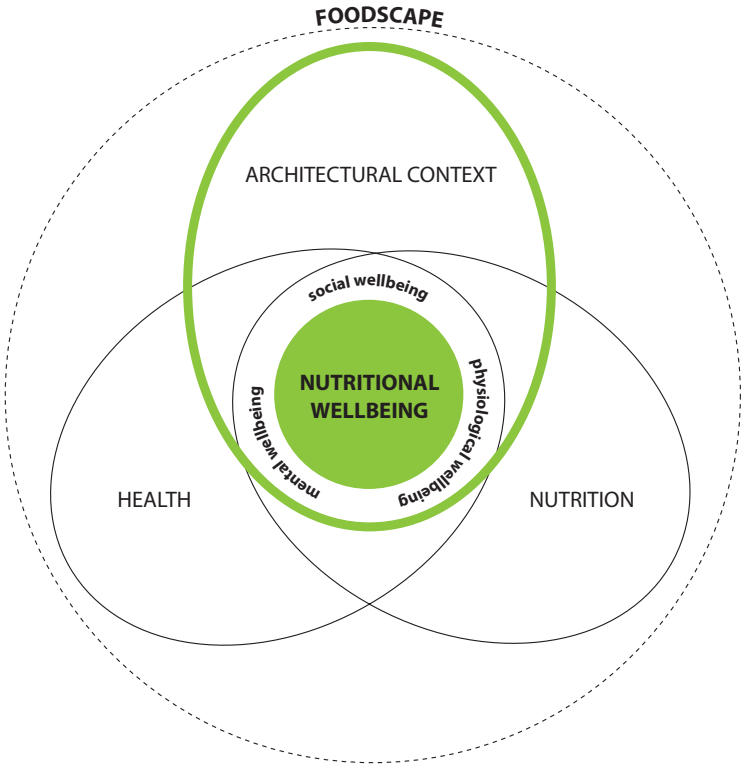

Fig. 1 "A Holistic Viewpoint" Nutritional wellbeing not only depends on eating the specific food item and obtaining the right amount of nutrition, but further relates to the general health, wellbeing and built environment embracing the meal.

why is colored glasses and china better then steal containers? What is the architectural quality in these different elements and how does they relate to the overall atmosphere and social interaction created? Instead of clarifying some of these questions, it seems like the specific interior regulations conducted in the study are based on an intuitive and rather latent basis, not necessarily including any architectural considerations on the practical decisions on the interior and spatial configuration.

As with the study by Holm & Jacobsen (1990), neither the research, the research methods nor the specific studies within nutritional science, sociology and sensory science include in general any theoretical considerations on the specific architecture and *how* the spatial settings or interior design influence our eating environment and meal experiences. I wonder why that is? Because, within architectural theory it is often argued, from a phenomenological perspective, that architectural design is not an isolated matter of built form and spatial configuration, but a sensuous *phenomenon* framing our lives and behavior. (Groat & Wang 2002) Understanding architectural space as phenomena suggest further from a semiotic point of view that the built environment encompass the potential of a "disguised meaning" contrary the obvious function or immediate physical form. (Bek & Oxvig 1999, Peirce 1998) The theoretical importance is relative to patient meal servings that the meal experience is a constructed *phenomenon*, communicating a certain "idea" and "sense of place" through the dining interior and its physical appearance, which can be changed and altered according to specific intentions on food behaviors and creating a social context. This understanding is based on a phenomenological and semiotic epistemological viewpoint as derived by Peirce (1998) and partly supported by for instance Merleau-Ponty (1994) and Hall (1966) where architectural spaces relates to human existence and behavior. But it also relates to aspects of the social science and sociology, where the aspects of human behavior and interaction can help us understand how to design spaces and specific architectural settings to create certain atmospheres inviting for specific social relations. An important knowledge contribution of this PhD project is therefore the development of a theoretical framework reflecting the social and emotional value of space and sense of place in nutritional wellbeing by merging existing theories within social science/ sociology, nutrition and health with architectural theory.

Fig. 2 Theoretical background

Contemporary nutritional research often includes theoretical perspectives of health and sociology, but rarely considers the spatial and architectural aspects.

Methodological Considerations

There are many ways to frame such a research problem and within architectural research we can choose from various quantitative and qualitative methods for gathering information on spatial configuration and human behavior, as well as for analyzing and understanding the qualities of architectural design. (Groat & Wang 2002) The specific pick of research methods and research strategy then traditionally depends not only on the purpose and goal of the project, but often also on the particular research tradition our branch represents and its' inherited ontological and epistemological backgrounds. (Yin 2009) With this PhD project, the purpose and goal is to develop both a scientific body of knowledge for creating a theoretical framework on foodscape design and generating a conceptual proposal for design guidelines on future patient dining facilities. However, as argued for above we do not have any predefined research branch within foodscape design to help define our research strategy and methodological approach. But touch upon a range of affirmed and well established research areas like food and meal science, as well as health and medicine, whose epistemological and methodological backgrounds often stand in stark contrast with the branch of architectural theory and design.

Research Traditions

For instance, historically healing patients at hospitals were a matter of strict surgical or medical treatments, where patients' sickness had a causal objective explanation either being a matter of chemical or physiological dysfunctions. (Gabe & Calnan 2009, Sohlberg 2004 p. 141) A strict division between physiological and psychological aspects of health dominated hospital procedures, and healing processes were often stripped off any healthcare involving subjective or emotional awareness on sickness. (Sohlberg 2004) This understanding is rooted in the logical positivism and a material ontological view on reality, where scientific knowledge is defined as logical, understandable and confirmable, based on an empirical reality separate and independent from any individual subjectivity. (Sohlberg 2004 p. 85) It is a deductive and causal way of reasoning free of any interpretations or speculations, and scientific knowledge can only be verified by mathematical and statistical analysis, quantitatively and numerically verifying the generalizability of the findings. (Sohlberg 2004 p. 84) Not until recently, has research and practice in health and medicine acknowledged that patients' healing process and health possibly can be improved by greater awareness on healthcare involving perspectives of both *physical*, *mental* and *social wellbeing*. And fields of psychology and social science are, as seen from the above study by Holm & Jacobsen (1990), more frequently being included in hospital healthcare to broaden understandings on patients' healing processes. (Gabe & Calnan 2009)

The move from strict medical and surgical *treatments* to patient healthcare and *healing* as a more humanistic or naturalistic process expresses a general shift in the ontological and epistemological viewpoints, and ways of performing medicine at hospitals today. (Sohlberg 2004) However, the EBD researchers performing studies on different effects of the built environment on patient healing processes draw on quantitative research methods to collect empirical data on different environmental variables studied. (Ulrich et al. 2004) They utilize statistics such as; the length of patient stays, the rate of infections acquired during hospitalization, and the number of medication errors to determine whether built form impact on healing processes or not. (Ulrich et al. 2004) Part of the existing research on the meal experience is like the EBD rooted in this modern materialistic ontological viewpoint as well. For instance the research produced within the fields of sensory science,

consumer science and food science. Here research is mainly based on experimental studies performed in laboratories or in controlled eating environments. (Meiselman 2002) Research objectivity is the key goal, and like most surgical and medical research this knowledge rests on a general understanding that every phenomenon can be reduced to measurable physiological-chemical matter; molecules and atoms. (Sohlberg 2004 p. 85)

The opposing stand

Within parts of the nutritional research as well as contemporary design societies arguments exist against the use and implementation of evidence-based knowledge strictly obtained from experimental studies utilizing quantitative research methods like the above performed within EBD, as well as Food Science. Because research objectivity is achieved by systematically keeping any potential bias or interference out of research procedures, the causal knowledge is per definition only available if we are able of handling, controlling and measuring the different variables and nothing unexpected is allowed to dominate or affect the outcome. (Sohlberg 2004 p. 116)

Experimental studies on influences of the built environment both within EBD and research on nutrition and food, often holds the implicit assumption in their quantitative research methods that as long as the spatial settings of each experiment are kept stable, the appearance of physical space is not a disturbing variable. However, from a phenomenological point of view, considering the built environment as a "single collective variable" strongly interferes with the complex understanding of architectural space as phenomenon. Relative to the theoretical considerations above, architectural space is from a hermeneutic point of view strongly influenced by various cultural and contextual aspects; being a phenomenon and choreography of elements *together* forming a setting, a specific atmosphere and a certain behavior, and involving various subjective and emotional values. (Sailer et al. 2008, Bek & Oxvig 1999) Architecture is a *"gesamtkunstwerk"* and can therefore not with its complex composition be ignored in the empirical investigations, but must be considered as the complex combination of a series of dependent variables it is. Architecture is both built form and a specific space, but it is also atmosphere, "idea" and a certain sense of place. (Norberg-Schulz 1965, Tuan 1977) Trying to deduce these elements from each other and evaluate them one by one like in the experimental studies of EBD and food science ignores the system of the whole, and the impact of the built environment and sense of the architectural space will possibly affect and disturb the findings of the experiments. The architecture will start acting as a set of confounding variables in itself. (Sailer et al. 2008) The result is simply influenced by too many elements, and the specific information needed is a complex mixture of latent and unconscious knowledge. (Sailer et al. 2008) With the strict positivist approach and the quantitative research methods we risk losing the significance of the architecture, lose the meaning, intent and emotional effect. But we also risk losing the aspects of validity in the research methods themselves. Because the more complex the problems and experiments are, the more complex the human interaction are, the more difficult it becomes to operationalise and keep disturbing variables constant, and thus be able to generalize the findings. (Sohlberg 2004:118) It can therefore be argued that the existing empirical studies in general lack the ability to take into account not only the personal, social and cultural values, but also the **architectural values** of experiencing, perceiving and reading space. Opposing stands therefore often affect not only the methodological approach of quantitative research, but the entire ontological basis defining how to read, analyze, and understand the architecture and the built environment. (Groat & Wang 2002 p. 25-29, Sailer et al. 2008)

Providing a "thick description"

The above opposing way of thinking is based on a holistic ontological viewpoint where multiple realities exist, rather than just one single. Here individual ideas, language and perceptions cannot be separated from the outside world, and individuals create their own subjective realities. (Sohlberg 2004) It is an ontological viewpoint belonging to the naturalistic tradition and an important epistemological difference is that the "knower" and "knowledge" are interrelated and interdependent; that research methods therefore naturally incorporate subjective reasoning and interpretation from the researcher. (Sohlberg 2004) Contrary the positivist research tradition, this means refining the understanding of building scientific knowledge and acknowledging qualitative research methods like; interviews, participant observation and focus groups, together with hermeneutic interpretations and quantitative research methods to obtain empirical data and achieve as nuanced and precise a picture of human behavior as possible. (Filstead 1970, Sohlberg 2004) Building scientific knowledge and performing research thereby becomes a matter of achieving; *credibility*, *transferability*, *dependability*, and *confirmability*, rather than *internal validity*, *external validity*, *reliability*, and *objectivity*. (Groat & Wang 2002 p. 35)

Most important is that the idea behind the research criteria *credibility* similar to the positivist *validity*, should establish "truth value" by taking into account the natural complexities inherited in the specific situation studied. (Groat & Wang 2002:38) Methodologically this is mainly achieved by building a *"thick"* set of descriptions using a variety of information sources, multiple investigators, and/or a combination of research methods, in order to cross-check information and interpretations, as well as to insure a systematic and transparent process verifying the neutrality, consistency and applicability of the knowledge developed. (Geertz 1973, Groat & Wang 2002) In our specific case for instance the mixture of theoretical observations with different empirical observations, and the mixture of qualitative and quantitative knowledge.

However, because the hypothesis and the existing theoretical framework is based on both empirical and theoretical knowledge ranging across very different research fields, we balance many different kinds of information and types of knowledge. We therefore need an overall research strategy and methodological approach allowing for a combination of the narrative and non-numerical values, as well as hermeneutic perspectives together with existing empirical and quantitative measurements within the cross-disciplinary area of the foodscape.

The Research Strategy

In western research cultures we traditionally distinguish between two primary research strategies; the deductive approach or the inductive approach. The inductive approach builds on a bottom-up research strategy utilizing empirical information gathered either quantitatively or qualitatively to describe or predict rules to a specific phenomena and on this basis develop a hypothesis and build theory. (Groat & Wang 2002) The deductive strategy on the other hand builds on a top-down approach utilizing quantitative or qualitative research methods to verify an already existing theory and its hypotheses. (Groat & Wang 2002) As mentioned above, no specific research tradition is yet built on the matter of foodscape design, and there are as such no predefined theory or research methods to pick from in our specific case when building scientific knowledge to support the hypothesis and answer the research questions. We can therefore not engage in an overall deductive research strategy seeking empirically to verify an existing theory. But, we must build on top of the

existing research and the empirical inductive investigations already existing within healthcare, sociology as well as food science and nutrition, as performed by for instance Holm & Jacobsen (1990). We must continue the *inductive strategy* towards the building of a theoretical framework, and then use this theory in a *deductive manner* to establish a set of design guidelines on future patient dining facilities.

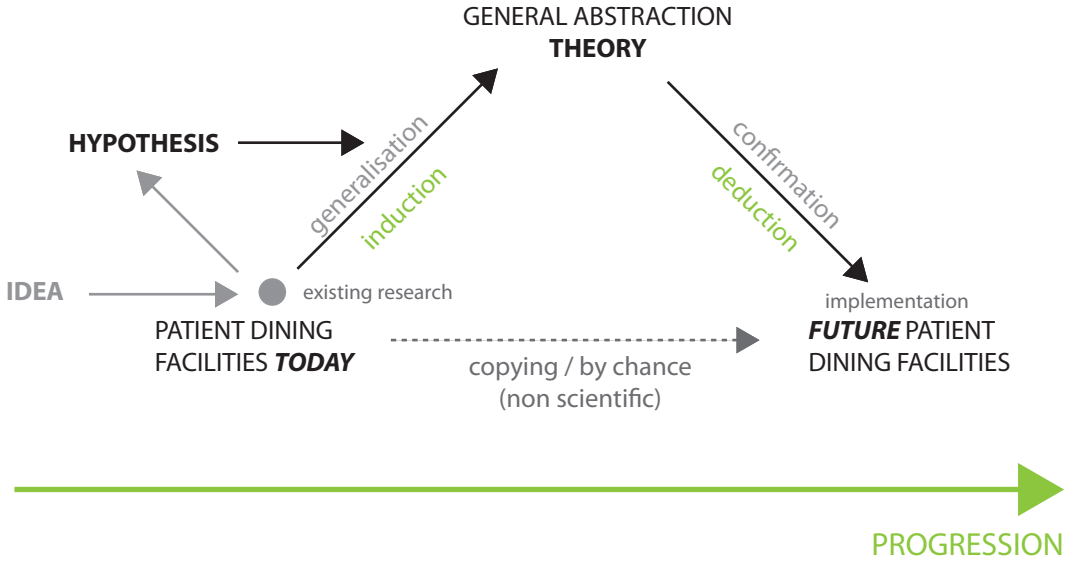

Fig. 3 Research Strategy

The idea of the foodscape developed out of a general wonder about the relationship of architecture and food. Then on the basis of a review of existing research the hypothesis developed. Because no contemporary theory exist supporting the hypothesis we must build a theoretical framework to be able in a scientific manner to argue for how to design the future patient dining facilities. (model by inspiration of Brodersen 2007)

Developing a theoretical framework

According to Yin (2009), a possible more humanistic validity-seeking methodology to build such a theoretical framework is the specific approach of the case-study. The case study in his terms gives the ability to understand and analyze a real-life phenomenon and its contextual conditions in depth without manipulating relevant behaviors. (Yin 2009 p. 18) This ability is based on the case study's' unique capacity as a research design to deal with a full variety of qualitative and quantitative evidence *together*. (Yin 2009 p. 11)

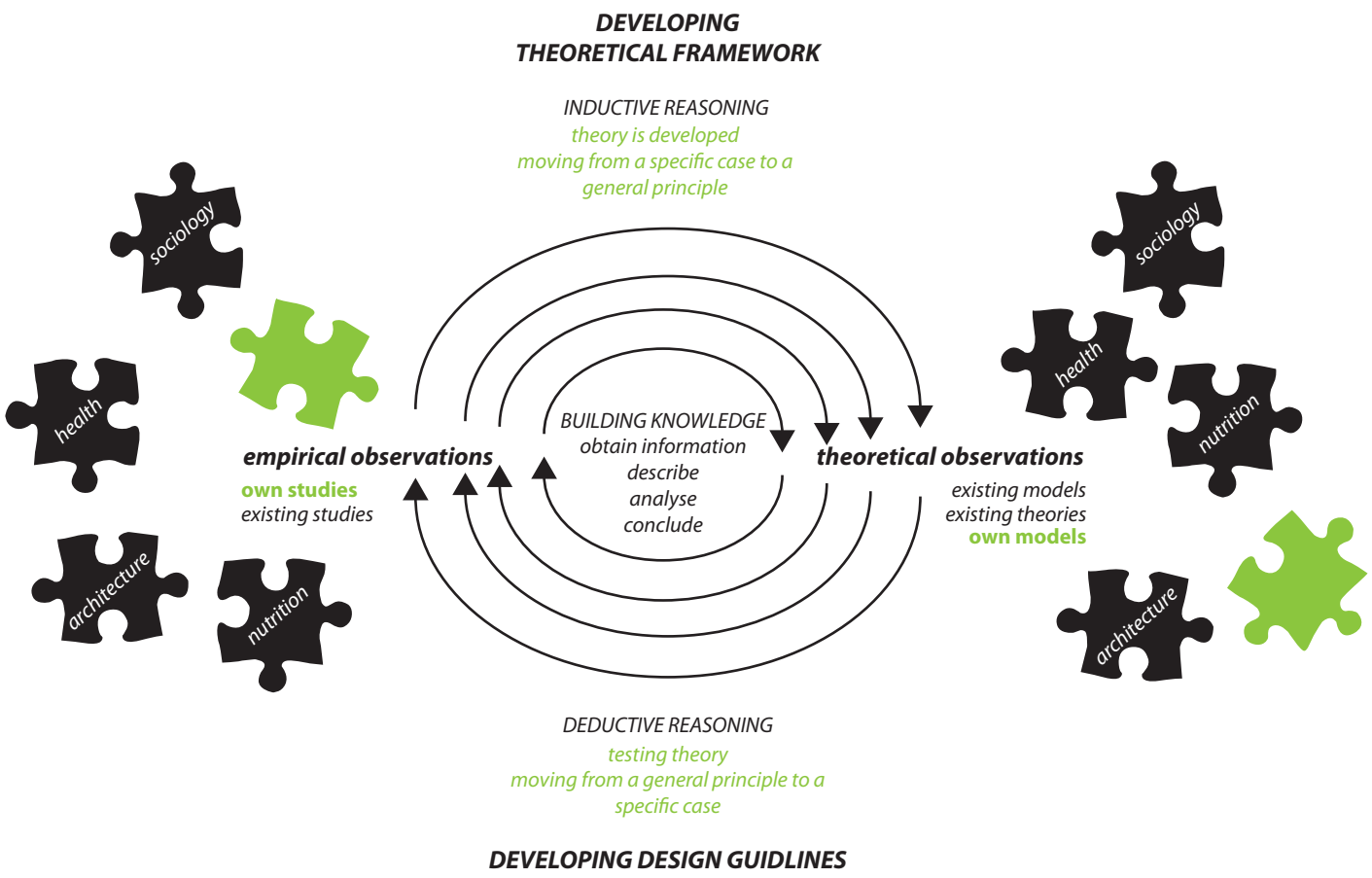

Fig. 4 Developing a Theoretical Framework

Developing a theoretical framework merging knowledge from distant research areas and utilizing different qualitative and quantitative research methods demands a research strategy encompassing a combined inductive and deductive way of reasoning allowing the various kinds of knowledge to support each other and build scientific evidence together.

The case study

The case study approach utilizes in a triangulating fashion the information gathered with different research methods to establish a strong chain of evidence or the "thick description", together supporting the theory from multiple sources. (Yin 2009 p. 18) However, according to Yin (2009 p. 18-19) the case study and its research methods benefits from the prior development of a theoretical proposition to guide the data collection and analysis process, otherwise too complex for survey or experimental strategies. In our case that means that to be able to build a theoretical framework using the case study approach, it is essential that we develop an initiative theory as part of the overall research design, so this can work as a guiding tool for how to perform further studies to verify the general theoretical framework. The initiative theory is meant as a hypothetical story about why acts, events, structure and thoughts occur, and the result is according to Yin (2009 p. 38), that the theory development not only facilitates the empirical data collection phase of the case study, but further provides the level of generalization. This is by Yin (2009) characterized as analytical generalization as opposed to statistical generalization ordinary used within the positivist research tradition, and can be described as an ongoing circular process. The point is that within our research process we continuously move between a deductive and inductive process; from a theoretical level of knowledge establishing a general set of guidelines or hypothesis on why and how built environment influence the nutritional wellbeing of patients, to testing the hypothesis empirically on the hospital dining facility. The theoretical knowledge is then used as a practical template on how to gather empirical information in the specific field studies, but also on how to compare the empirical results from different sources. (Yin 2009 p. 38)

Research Design

From figure 5 we see that answering the hypothesis and research question is based on an overall deductive research approach, building a theoretical framework and developing a conceptual set of design guidelines, based on both hermeneutic and empirical investigations and utilizing qualitative, quantitative and interpretative research methods. The purpose of the specific methodological design is to gain as much insight and knowledge as possible on how the architecture and design of the patient dining facilities influence the nutritional wellbeing and healing process of the patients. However, investigating the experience of eating and built environment is a very complex task including various known and unknown emotional dimensions to consider. Therefore a multilayered methodological approach obtaining knowledge from three different kinds of "observation"; *theoretical hermeneutic observations*, *empirical qualitative observations* and *empirical quantitative observations*, are chosen within the overall frame of the case study as means to capture the character and atmosphere of the eating culture, the personal and social affiliations as well as the architecture. Together these three kinds of "observation" utilizes three different levels of information or "knowledge"; *descriptive*, *analytical* and *explanatory* knowledge. Each of the three levels of information represents different levels of abstraction which cannot be compared across the different levels, as they represent different kind of knowledge. But different situations providing same levels of abstraction can be compared. If two or more cases show to support the same theory, then replication may be claimed, and the empirical results may be considered yet more potent if two or more cases support the same theory but do not support an equally plausible rival theory. (Yin 2009 p. 39) In our case that means, that when approaching the specific research question and the specific sub-questions we should be aware to gather information and

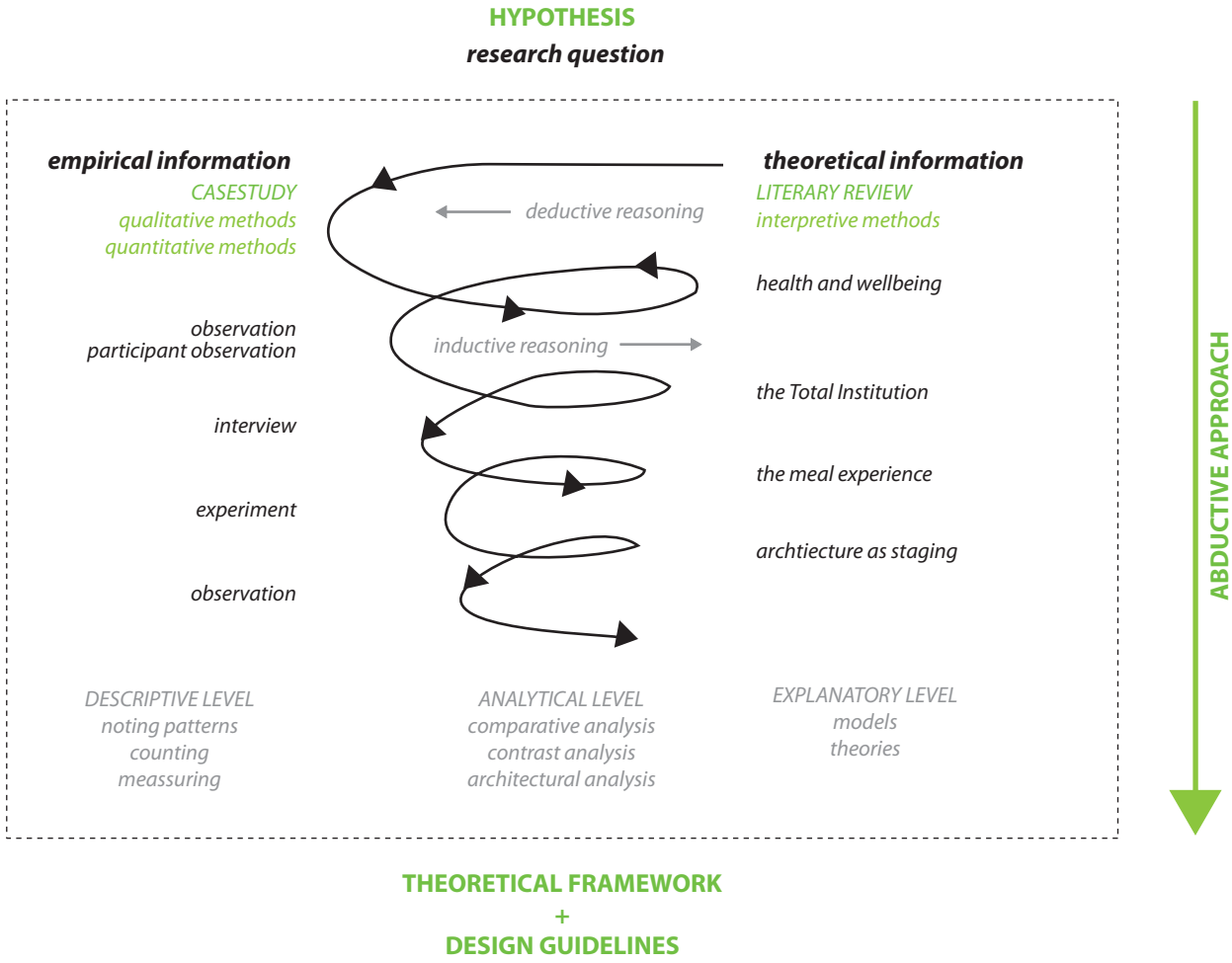

Fig. 5 Methodological Approach

The overall research strategy is moving from the hypothesis to a general theoretical framework, and then towards a specific set of guidelines for how to design future patient dining facilities. It as such utilizes a combination of inductive and deductive reasoning.

build knowledge on the basis of various sources and by means of various methods to perform a hermeneutic triangulation and cross-check our findings.

The empirical studies

The empirical investigations are used in two levels throughout the research process; as *explorative studies* taking their point of departure in the specific case of the project MORE at Aalborg Hospital and the current challenges on patient eating at the department of infection medicine, and as *comparative studies* gathering insights from *similar* and *contrasting* dining environments. The empirical studies are chosen first of all as means to unfold evidence-based in-depth understanding of *how* patients today use the spatial environment when eating and the goal is to be able to identify if certain patterns exist within different types of interiors and spatial configurations, as well as if different settings mediate different behavior and social interaction when eating. The specific qualitative research methods have been chosen as mean seeking together an in-depth account of the social context and insight in the dining behavior. The qualitative methods are primarily used for information gathering to build the theoretical framework and support the hypothesis, whereas the quantitative methods are primarily used to support the qualitative findings and verify the effect of the spatial and interior changes during the experimentation studies. The architectural registrations and spatial analysis are meant as both comparative studies on the knowledge derived, as well as inspirational studies on best-practice for developing an actual design proposal.

The theoretical studies

The purpose of the historical and interpretative studies are the unfolding of existing evidence-based and hermeneutic theory on cultural, sociological, nutritional and aesthetic aspects of built environments impact on human eating and meal behavior. The studies take their point of departure in main theories on healing architecture and meal experience investigating implicit and explicit ways built environment impact, form and interact with its actors when eating, as well as understanding how nutritional wellbeing and health are formed through meals and spatial settings. As part hereof further studying perception and language of space and foods experienced through the bodily encounters, time, culture, social relations and personal affiliations. The purpose of this is providing as "thick" a description as possible, because to achieve transferability within interpretative and qualitative research we must provide a "thick" description of the context, so that similarities can be drawn to other situations. (Groat & Wang 2002 p. 38)

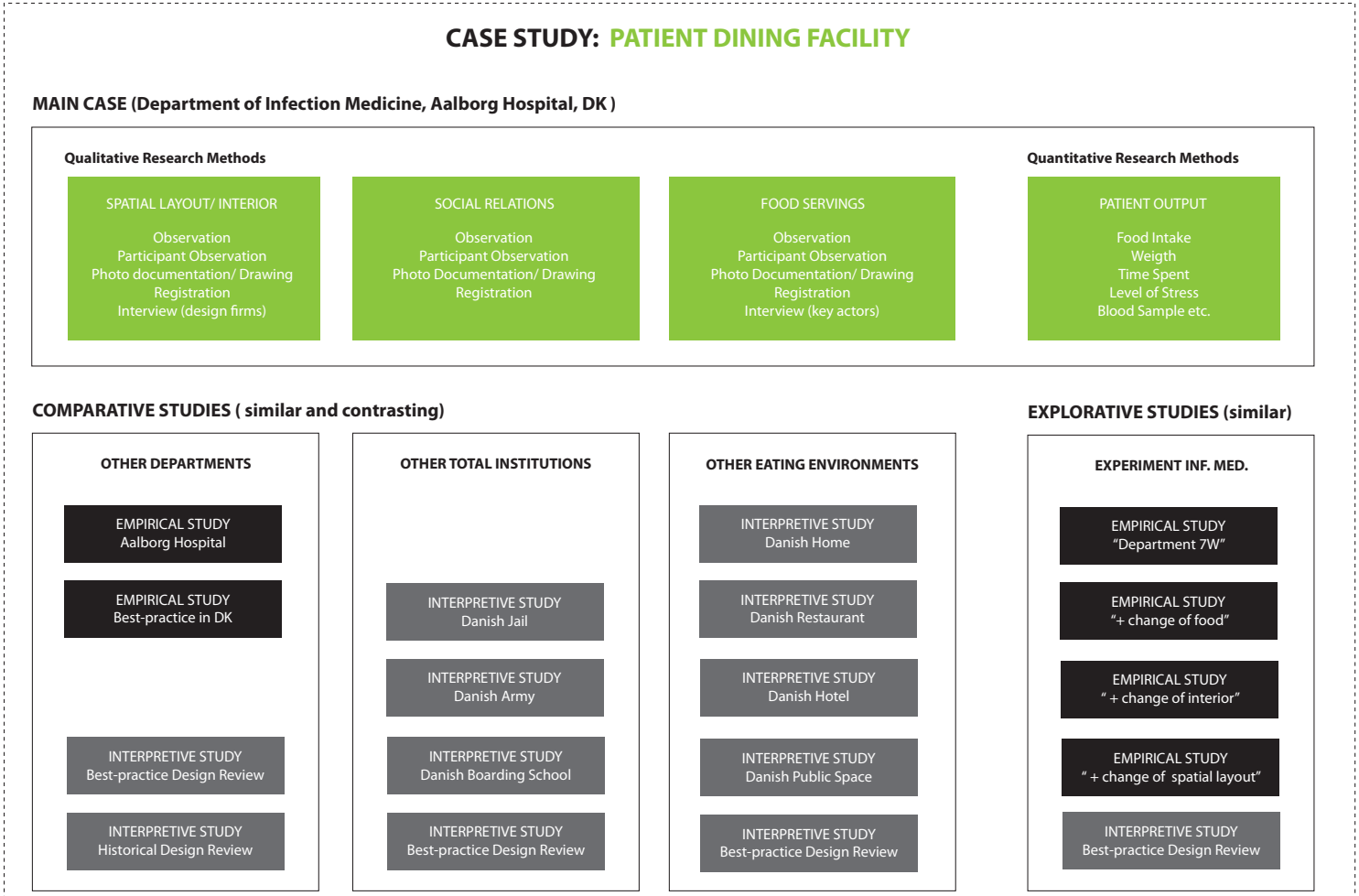

Fig. 6 Case Study Design

Embedded case study utilizing mix method approach

Concluding Perspective

Throughout history, performing research and building scientific knowledge has been described as a systematic and transparent process, developing hypothesis and testing theories. (DePoy & Gitlin, 2005 p. 4) Research is as such often described as a systematic set of ways of thinking and acting, and understood as a strict system of knowledge with distinct vocabularies to be learned and used to be able to both verify and communicate ones findings to others. Traditionally we say that the research design is supposed to represent a logical set of statements, which quality can be judged by the ability to achieve *construct validity, internal validity, external validity and reliability.* (Yin 2009 p. 40) As a researcher we need to be able to adopt these ways of thinking, developing and validating knowledge as well as transmit our knowledge into a system of inquiry, because the validation of scientific knowledge is build on the explication of how and on what basis the knowledge claim is made. (Groat & Wang 2002 p. 39) With this specific paper we were therefore asked to reflect on the kind of knowledge we contributes with to research and practice in general as young researchers, through an explication of how information and knowledge is obtained and asserted throughout our research process. And through a reflection on our overall research question, its' inherited ontological and epistemological backgrounds, as well as the specific methodological consequences the specific choice of research strategy and research methods had on our process of gathering, documenting and analyzing information, as well as building scientific knowledge.

With this specific PhD project we on the basis of the problem definition developed a hypothesis and implicit assumption that patients' nutritional wellbeing not only relates to eating, but is influenced by the entire meal experience and the surrounding dining environment. This PhD project thereby adopts an obvious phenomenological understanding of human existence and behavior, where we ascribe significance to spaces, form and objects we encounter – whether it being hospital architecture, patient dining interior, tableware or the specific meals – and does so on behalf of our bodily and sensuous contact, together with our inherited social and cultural norms and values. This phenomenological understanding contradicts a bit with the existing research within nutrition, health and hospital design. And because we in this PhD project as such touch upon a possibly new and interdisciplinary research area within foodscape design, which not already encompass a specific set of research methods and research strategies, we challenge the contemporary *knowledge* and *methodology*, as well as the prevailing *design practice* on patient dining facilities. The main ontological, epistemological and methodological importance for this project is therefore the divergence from the positivist research tradition within food science, nutrition and health into a naturalistic inquiry, where the legitimacy and value of many distinct types of knowledge, ways of reasoning and gathering information are recognized as valid ways to build scientific knowledge.

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